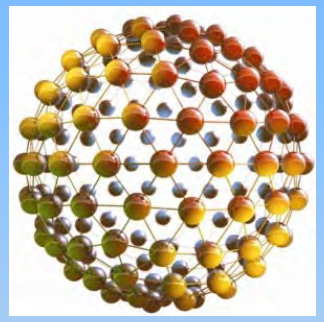
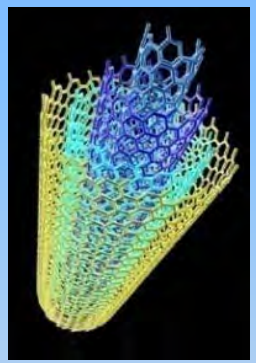
Managing Chemical & Material Risks

Acquisition, Technology and Logistics





December 2011

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Office of the Deputy Under Secretary of Defense
(Installations & Environment)

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What is an Emerging Contaminant?

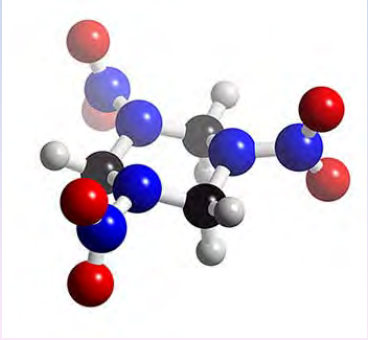
- Chemicals & materials that have pathways to enter the environment and present real or potential unacceptable human health or environmental risks…

and either

  - do not have peer-reviewed human health standards

or

  - Standards/regulations are evolving due to new science, detection capabilities, or pathways.



EC "Scan-Watch-Action" Process

Acquisition, Technology and Logistics

Over -the- horizon

EC News

Review literature, periodicals, regulatory communications, etc.

Possible DoD impacts

Phase I Assessment

Monitor events; Conduct Phase I qualitative impact assessment

Probable high DoD impacts

Phase II Assessment

Conduct Phase II quantitative impact assessment; develop & rank RMOs*

→ **Risk Management Options (RMOs) to ECGC**

↓

Approved RMOs become Risk Management Actions (RMAs)

Program Scorecard – Cumulative

- **Potential ECs screened --- 551**
- **Phase I Impact Assessments completed --- 31**
- **Phase II Impact Assessments completed --- 8**
  - All current/former action list chemicals completed.
- **Risk Management Options (RMOs) developed & turned into Risk Management Actions (RMAs)**
  - **18 completed, 31 in-progress, 3 pending, 2 deferred**

EC Watch List – Dec 2011

- ✓ Tungsten/sodium tungstate
- ✓ Tungsten alloys
- ✓ 1,4-dioxane*
- ✓ Metal Nanomaterials
- ✓ Carbon Nanomaterials
- ✓ Perfluorooctyl sulfonate (PFOS)
- ✓ Di-nitrotoluenes (DNT)
- ✓ Nickel
- ✓ Cadmium
- ✓ Manganese

- Cerium
- Cobalt
- Antimony
- ✓ Perfluorooctanoic acid (PFOA)
- ✓ Phthalates …added in FY-11
- ✓ Diisocyanates …added in FY-11
- ✓ TCE …moved from action list
- ✓ Perchlorate …moved from action list
- decaBDE …added in FY-11

✓ Phase I Impact Assessment completed

* To be re-assessed

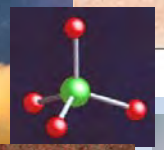
EC Action List - Dec 2011

- ✓ **Royal Demolition eXplosive (RDX)**
  - Cyclotrimethylenetrinitramine
- ✓ **Hexavalent Chromium (Cr6+)**
- ✓ **Naphthalene** **…pending downgrade to watch list**
- ✓ **Beryllium (Be)**
- ✓ **Sulfur Hexafluoride (SF6)**
- ✓ **Lead**

✓ **Phase II Impact Assessment completed.**

Perchlorate Risks ~ 2005

- **Curtailment of training on ranges**
- **Potential liability for water/drinking water contamination**
- **Lack of health standards causing conflicts with regulators**

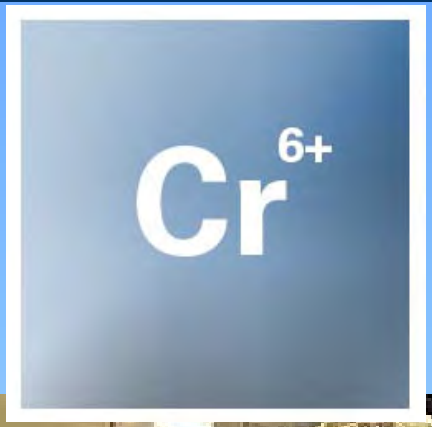


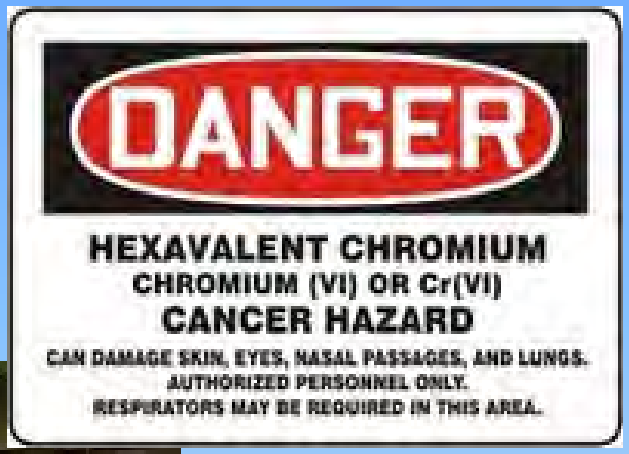
Perchlorate Risk Management Actions

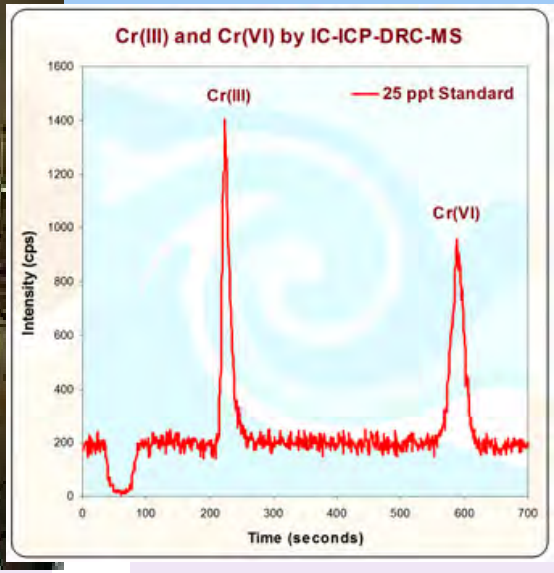
- SERDP/ESTCP[1] developed:
  - An isotopic analysis method to differentiate natural from man-made perchlorate
  - Peer-reviewed studies on non-DoD perchlorate sources
- Special DoD sampling program & database provided proof that DoD was not major source of contamination in drinking water…over 50,000 samples
- Army RDT&E on non-perchlorate ground burst simulators…~80% of perchlorate releases on ranges
- DoD-EPA-States EC work group resolved issues
- "Myth-busters" brief to Congressional staff and press helped defuse issue regarding DoD perchlorate releases
  - Aug 2010 Government Accounting Office report described DoD actions and non-DoD sources…no recommendations

[1] Strategic Environmental Research & Development Program---Environmental Security Technology Certification Program

DoD Hexavalent Chromium Risk Reduction







Hexavalent Chromium Risk Management Actions

- DoD minimization policy signed April 2009
- DFAR[1] clause to minimize uses in new systems published May 2011
- Project underway to find & minimize legacy uses of Cr6+
  - Developed innovative methods to find chemicals/materials in DoD specifications and link them to specific parts and applications
  - Found 779 specs calling for Cr6+…found "low hanging fruit" for possible substitutions
  - Working with specification owners to specify suitable substitutes…must meet performance requirements
- DoD-wide database established on suitable substitutes - managed by SERDP/ESTCP[2]
- Accelerated corrosion testing protocol being developed via SERDP/ESTCP[2]

[1] Defense Federal Acquisition Regulation

[2] Strategic Environmental Research & Development Program---Environmental Security Technology Certification Program

Lead – Why on the Action List?

- **Evolving science & regulations pose a risk to range operations…most munitions contain lead**

- **Lead-free electronics pose a risk to DoD supply chain…short-circuiting in components**

Material Availability & Relative Risk Issue

Deca-BDE[1]

- Flame retardant used in electronics, wire and cable insulation, textiles, automobiles & aircraft
  - **It saves lives**
- EPA: "Studies have shown that decaBDE persists in the environment, potentially causes cancer and may impact brain function.“
- Manufacturer: “Hundreds of science-based and peer-reviewed studies have shown decaBDE to be safe in use and one of the most efficacious flame retardants in the world.”
- EPA & companies agree to phase out production & sales for most uses 31 Dec 2012, & end all uses by end of 2013

[1] decabromodiphenyl ether

Flame Retardants in Aerospace Products Have Increased Survivability

- **Assures safety in flight, if fire occurs**
- **Assures ability to escape, if aircraft crash occurs**
- **Meets FAA requirements**
  - 14 CFR Part 25 regulations:
    - Section 25.853, Compartment Interiors
    - Section 25.855, Cargo/Baggage Compartment
    - Section 25.856, Thermal/Acoustic Insulation
    - Section 25.869, Wire Flammability
    - Appendix F, Detailed Test Requirements
      - Materials and parts must successfully pass test/s in order to show compliance
      - Nine (9) different tests specified; some materials/parts must pass multiple tests
      - Variations of configurations require individual testing

2008 Continental Airlines 737
0 fatalities, 115 survivors

DecaBDE has become integral to meeting stringent aviation safety requirements

DecaBDE is Used in Many Applications in Most Boeing Products

- Adhesives and Tapes
- Composites
- Ducting & Molded Parts
- Electrical/Electronics
- Emergency Equipment
- Fabrics & Films
- Insulation
- Interiors
- Sealants







Boeing has a Global, Multi-Tiered Supply Chain

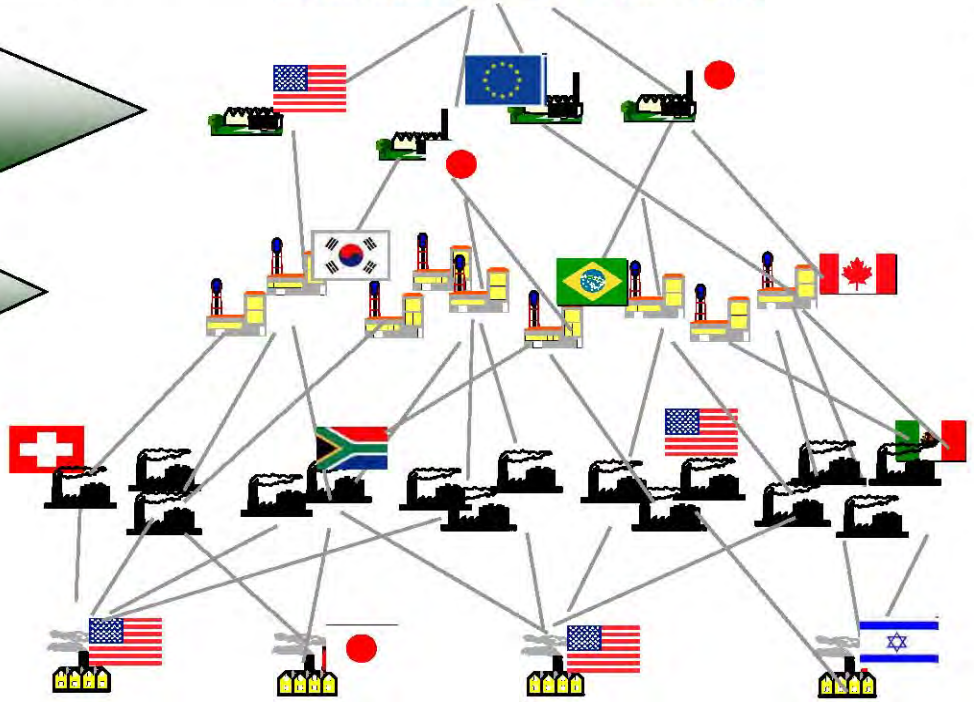
Boeing
Aircraft with a Lavatory

Commodity Supplier-
Supplier Owned Design:
Lavatories with Panels

Part Mfg
Panel with Edge Potting

Material Mfg
Potting Compound

Chemical Mfg
DecaBDE



Global Supply Chain

737 Lavatory

DecaBDE alternative manufacturers & compounders drive the replacement timetable

Department of Defense Emerging Contaminants Program

Harvard University – Ash Institute for Democratic Governance & Innovation

Questions & Discussion

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